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Environmental Protection
Agency

Environmental Monitoring
Systems Laboratory
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December 1993

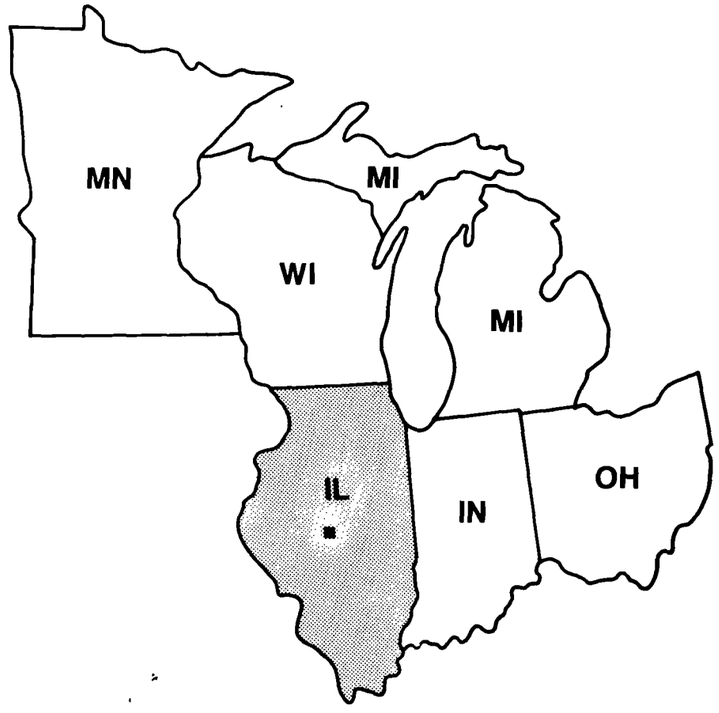
Research and Development

EPA

AERIAL PHOTOGRAPHIC ANALYSIS OF THE PIERCE WASTE OIL/ MORECO ENERGY STUDY AREA

Springfield, Illinois

EPA Region 5



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AERIAL PHOTOGRAPHIC ANALYSIS OF THE PIERCE WASTE OIL/MORECO ENERGY STUDY AREA

Springfield, Illinois

by

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Contract No. 68-C0-0050

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OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89193-3478

NOTICE

This document has undergone a technical and quality control/assurance review and approval by personnel of the EPA/ORD Environmental Monitoring Systems Laboratory at Las Vegas (EMSL-LV), and is for internal Agency use and distribution only.

ABSTRACT

The Pierce Waste Oil/Moreco Energy study area occupies approximately 35 acres in the western part of Springfield, Sangamon County, Illinois. The five black-and-white and one color infrared aerial photographic coverages selected for analysis in this report were flown between 1939 and 1988. This analysis was conducted to monitor activities and physical conditions that could lead to contamination of the surrounding environment.

No visible wetlands or stressed vegetation were noted. No streams in the area pose a threat, to the study area, from a 100-year flood. Disposal of solid waste/fill activity was first observed in May 1939 and continued through November 1971. Very extensive and heavy staining was visible in the southern part of the study area on all photos. There were leaking and uncontained tanks in the area, unlined pits containing dark liquid, of which some escaped in 1964. The ground around these pits appeared to be saturated. Accumulations of standing liquids were observed in the study area in July 1956, April 1964, and November 1971.

The U.S. Environmental Protection Agency's Environmental Monitoring Systems Laboratory in Las Vegas, Nevada prepared this report for the Agency's Waste Management Division in Region 5 at Chicago, Illinois and the Office of Emergency and Remedial Response in Washington, D.C.

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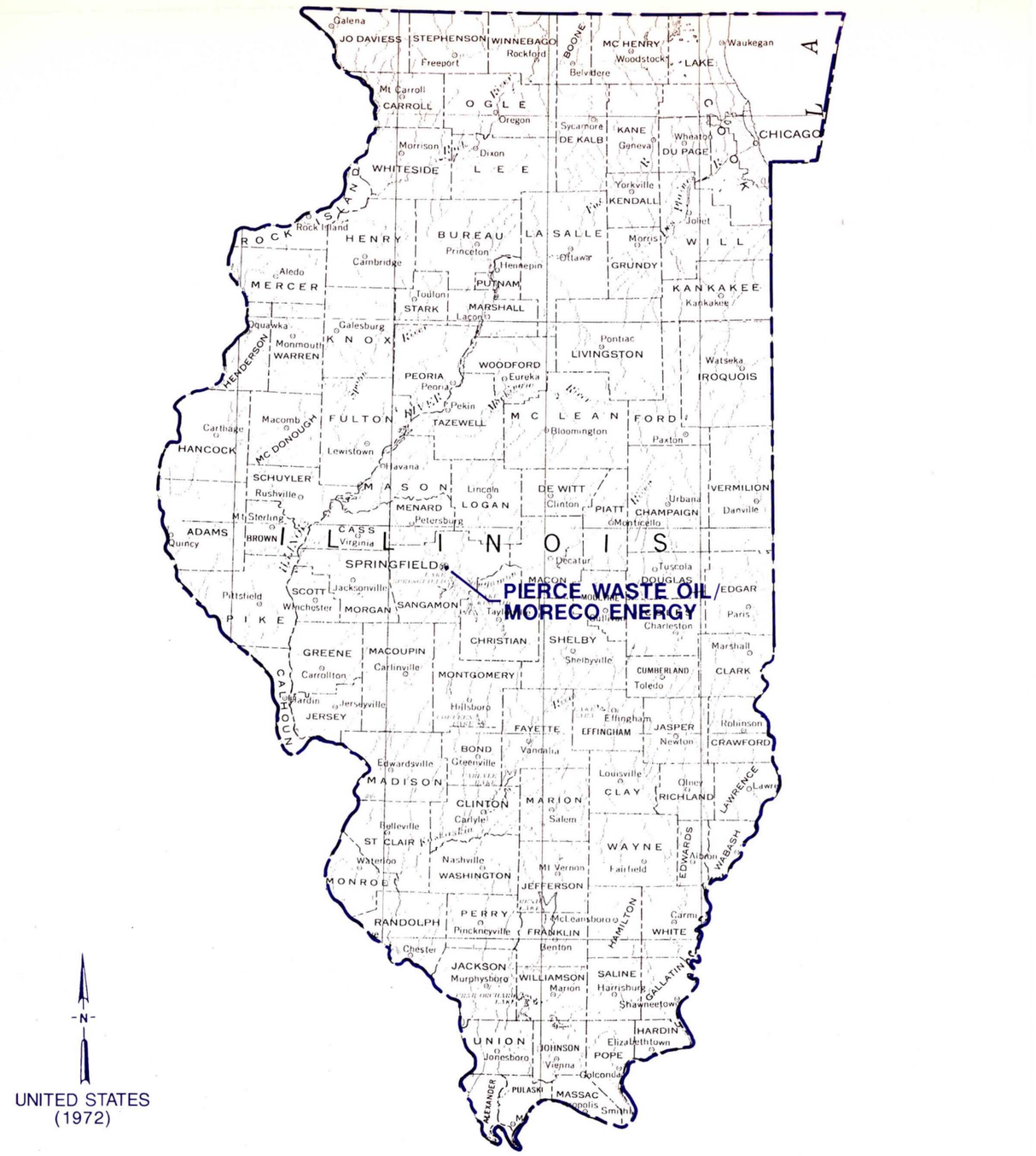


Figure 1. Study area location map, Illinois. Scale 1:2,800,000.

INTRODUCTION

This report presents an aerial photographic analysis of the approximate 35 acre Pierce Waste Oil/Moreco Energy study area located in the east central part of Springfield, Illinois (Figure 1). The one color infrared and five black-and-white aerial photographic coverages selected for analysis in this report were flown between May 1939 and April 1988. This analysis was conducted to monitor activities and physical conditions that could lead to contamination of the surrounding environment. Ground stains were clearly visible within the Pierce Waste Oil/Moreco Energy site beginning in May 1939, and became more predominate on each successive photo coverage through April 1988. There were many uncontained leaking tanks observed, and extensive depositing of solid waste/fill material occurred during this period of time.

The U.S. Environmental Protection Agency's Environmental Monitoring Systems Laboratory in Las Vegas, Nevada prepared this report for the Agency's Waste Management Division in Region 5 at Chicago, Illinois and the Office of Emergency and Remedial Response in Washington, D.C.

METHODOLOGY

Stereoscopic pairs of historical aerial photographs were used to perform the analysis. Stereo viewing enhances the interpretation because it allows the analyst to observe the vertical as well as horizontal spatial relationships of natural and cultural features. Stereoscopy is also an aid in distinguishing between various shapes, tones, textures, and colors that can be found within the study area.

Evidence of waste burial is a prime consideration when conducting a hazardous waste site analysis. Leachate or seepage resulting from burial and dumping of hazardous materials might threaten existing surface or ground-water resources. Pools of unexplained liquid are routinely noted because they can indicate seepage from buried wastes and may enter drainage channels that allow contaminants to move off the site. An excellent indicator of how well hazardous materials are being handled at a site is the presence or absence of spills, spill stains, and vegetation damage. Trees and other forms of vegetation that exhibit a marked color difference from surrounding members of the same species are labeled "stressed", "damaged," or "dead" based upon the degree of noticeable variation. Vegetation is so labeled only after consideration of the season in which the photography was acquired.

Drainage analysis identifies the direction a spill or surface runoff would follow. Direction of drainage is determined from analysis of the photographs and from U.S. Geological Survey topographic maps. Whenever they are available, 7.5-minute quadrangle maps (scale 1:24,000) are used to show site location and to provide geographic and topographic information. The site boundaries as depicted on maps and photos within the report were selected by the analyst, and are not intended to be used as legal boundaries.

The U.S. Environmental Protection Agency's Statement of Procedures on Floodplain Management and Wetlands Protection (Executive Orders 11988 and 11990, respectively) requires EPA to determine if removal or remedial actions at hazardous waste sites will affect wetlands or flood plains and to avoid or minimize adverse impacts on those areas. To aid in compliance with these orders, significant wetland areas

located within and adjacent to the site have been identified when present. However, these sites have not been visited to verify the accuracy of wetland identification.

Results of the analysis are shown on annotated overlays attached to the photos. The following table provides documentation of the photographs used in this report:

TABLE 1. DOCUMENTATION OF AERIAL PHOTOGRAPHY

Site name, location, geographic coordinates, EPA ID# and SSID#	Figures	Date of acquisition	Original scale	Film type*	Photo source†	Photo I.D.	Frames
Pierce Waste Oil/	3	05-30-39	1:22,590	BW	NARA	BHD	9
Moreco Energy	4	06-10-46	1:29,090	BW	EROS	CB	58
Springfield, Illinois	5	07-22-56	1:20,210	BW	WHITER	22650	64
	6	04-09-64	1:18,115	BW	EROS	VAVE	83
39°48'11"N	7	11-10-71	1:28,235	BW	SURDEX	SURDEX	67
089°37'41"W	8	04-14-88	1:40,850	CIR	MH	17167	88
EPA ID #ILD041538687 SSID #05-RS							

*Film type identification:
B&W: Black-and-white
CIR: Color Infrared

†Photo source identification:

EROS: U.S. Department of the Interior, Geological Survey, Earth Resources Observation Systems Data Center, Sioux Falls, South Dakota
MH: Mark Hurd Aerial Surveys, 345 Pennsylvania Avenue, South, Minneapolis, Minnesota
SURDEX: Surdex Corporation, 520 Spirit of St. Louis Blvd. Chesterfield, Missouri
WHITER: Whittier College, Department of Geology, Fairchild Aerial Photography Collection, 13406 East Philadelphia Street, Whittier, California
NARA: National Archives and Records Administration, Washington, D.C.

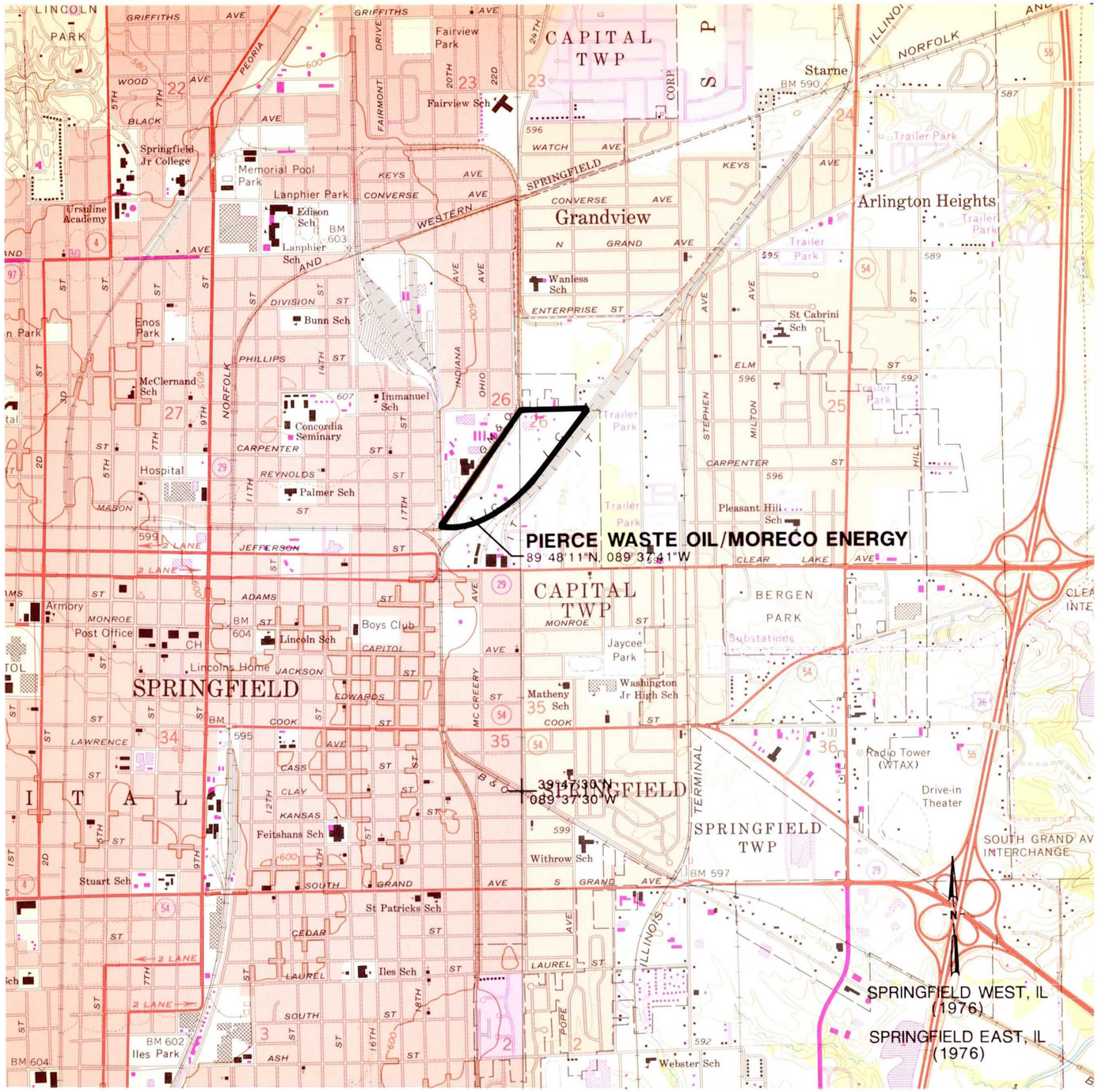


Figure 2. Local study area location map, Springfield, Illinois. Scale 1:24,000.

ANALYSIS SUMMARY

The Pierce Waste Oil/Moreco Energy study area occupies approximately 35 acres in the east central part of Springfield, Illinois (Figure 2). The area is extremely flat with a very slight overall slope to the north and east. There were no visible wetlands in the area and no stressed vegetation was noted. There are no streams in the vicinity, from which a 100 year flood would pose a threat to this facility.

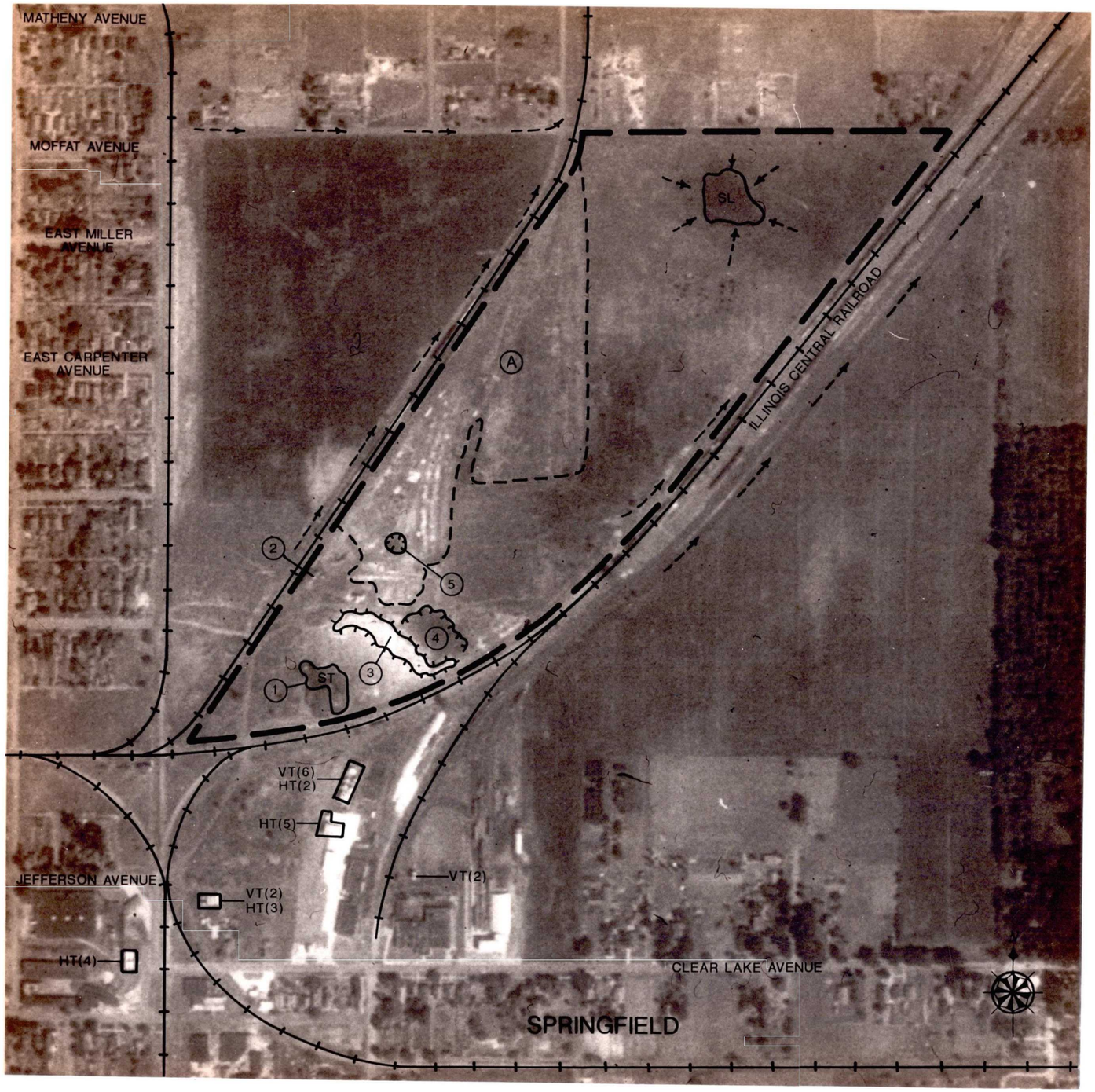
When first observed on the May 1939 photography, the Pierce Waste Oil/Moreco Energy study area occupied the area between two rail lines, from Matheny Street south, to just north of Jefferson Street. In the southern part of this area there was filling activity, a pit and depression containing liquid, and staining around a building. By June 1949 the staining had increased, there were new uncontained tanks, and the filling activity had ceased. Prior to July 1956 new facilities had been constructed in the area. There were many new uncontained tanks and extensive staining in the southern part of the site. Solid waste had been deposited in the area and standing liquid had accumulated on the north side of the waste. Extensive construction had occurred in the study area prior to April 1964, including numerous uncontained tanks. There were many leaking tanks in the area, liquid was escaping from an unlined pit, and there was very extensive staining throughout the site. Solid waste/fill material that had been deposited in the area was being spread over a large stain. A security fence was built around the Pierce Waste Oil/Moreco Energy facility prior to November 1971. There were many leaking tanks and heavy staining was visible throughout the site. A light colored material was being spread over some of the staining. The heavy staining and leaking tanks were again visible in April 1988. The sump and pits, where spillage had been observed earlier, were no longer present.

PHOTO ANALYSIS

MAY 30, 1939 (FIGURE 3)

The Pierce Waste Oil/Moreco Energy study area is located at the juncture of two rail lines in the east-central part of Springfield, Illinois. This approximately 35 acre area is extremely flat with no apparent slope. Drainage from this area will eventually follow the rail line in a northeasterly direction. There are no visible wetlands in this area and no stressed vegetation is noted. There are no streams in the vicinity, that pose a threat from a 100 year flood, to this site.

Two small buildings are located in the southwest part of the study area (Annotations 1 and 2). A moderate amount of staining is located on the north and east sides of the building at Annotation 1. What appears to be two small vertical tanks are located at the north end of the building at Annotation 2. It appears as though the light-colored mounded material at Annotation 3 is being pushed into the depression at Annotation 4. There is a slight glint in the bottom of this depression, indicating the presence of liquid. What appears to be a very similar shining substance is located in the pit at Annotation 5. Adjacent to the rail line that forms the northwest boundary of the study area, fill material is being deposited and spread (Area A).



INTERPRETATION CODE

BOUNDARIES AND LIMITS

- FENCED SITE BOUNDARY
- UNFENCED SITE BOUNDARY
- FENCE
- STUDY AREA

DRAINAGE

- DRAINAGE
- FLOW DIRECTION
- INDETERMINATE DRAINAGE

TRANSPORTATION/UTILITY

- VEHICLE ACCESS
- RAILWAY

SITE FEATURES

- DIKE
- STANDING LIQUID
- SL STANDING LIQUID
- EXCAVATION, PIT (EXTENSIVE)
- MOUNDED MATERIAL (EXTENSIVE)
- MM MOUNDED MATERIAL (SMALL)

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- ST STAIN
- SW SOLID WASTE
- TR TRENCH
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- WD WASTE DISPOSAL AREA
- WL WETLAND

Figure 3. Pierce Waste Oil/Moreco Energy, May 30, 1939. Approximate scale 1:4,560.

JUNE 10, 1946 (FIGURE 4)

What appears to be five uncontained horizontal tanks are located in an area of dark staining near the north end of the building at Annotation 1. There are four tank cars on the rail siding south of this building. The tanks have been removed from the north end of the building at Annotation 2. The mound of light-colored material (Figure 3, Annotation 3) is no longer visible and most of the depression (Figure 3, Annotation 4) has been filled. The pit at Annotation 5 is still present, however there is no longer any indication of liquid in it. The three depressions in the north and eastern parts of the study area contain liquid that is probably rain water runoff from the area. No other changes are noted since the photo coverage in May 1939.

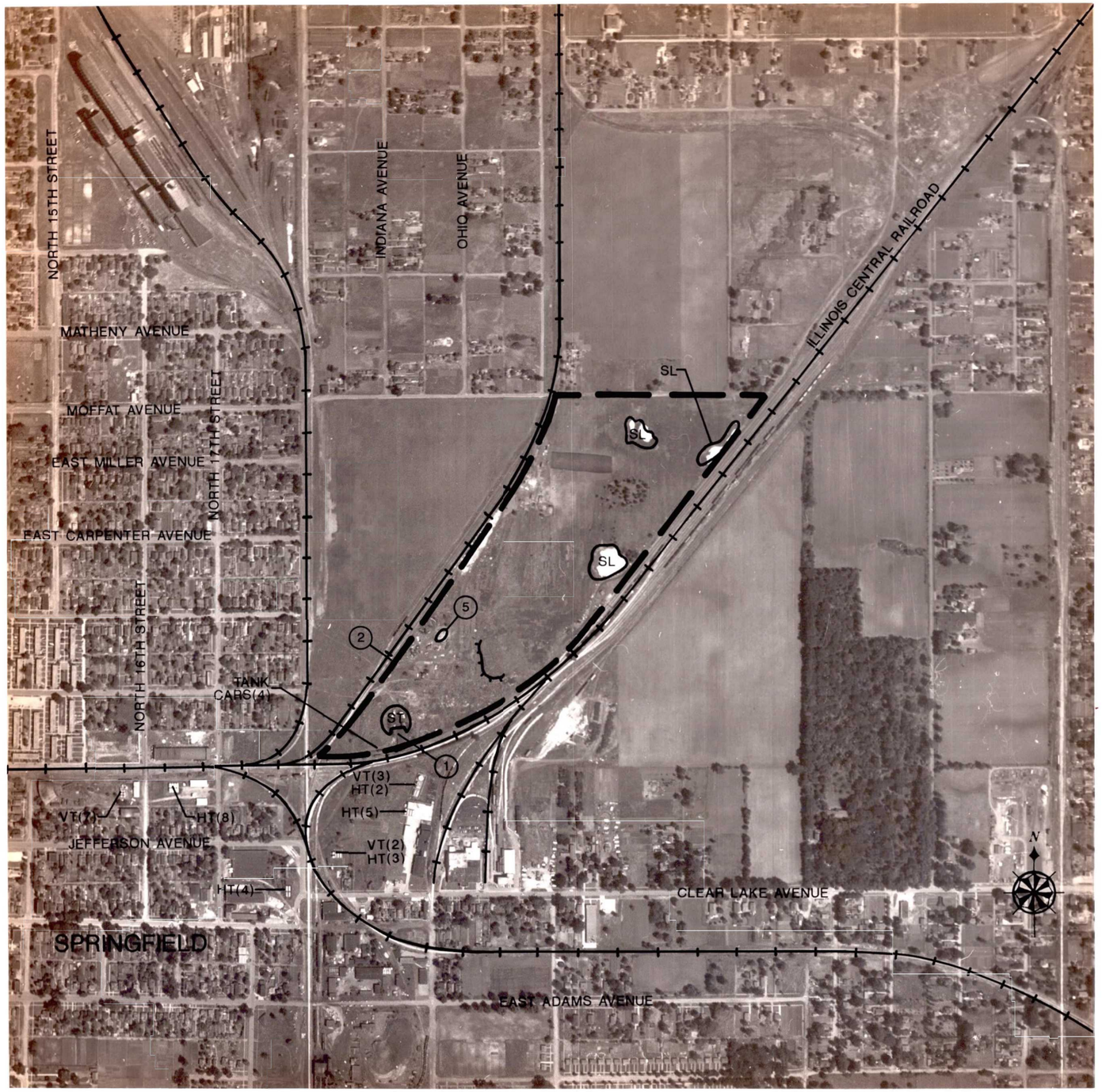

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Figure 4. Pierce Waste Oil/Moreco Energy, June 10, 1946. Approximate scale 1:7,680.

JULY 22, 1956 (FIGURE 5)

Since the photo coverage in June 1946 the Pierce Waste Oil/Moreco Energy study area has newly constructed facilities (Annotations 6 through 13 are the locations of 8 new buildings). There has been solid waste dumping in the central part of the study area, and extensive staining is noted in the southern part of the area. Six vertical tanks have been erected on the east side of the building at Annotation 1. There is very extensive staining around this building, and the new building at Annotation 6. Dark staining also extends from the south side of what appears to be a containment for horizontal tanks (Annotation 14). The inside of this containment is heavily stained and what appears to be concrete supports for horizontal tanks are located within the stained area. There is no significant change noted in the building at Annotation 2. There is staining inside the containment for the three new vertical tanks at Annotation 15. The new facility at Annotation 12 has 2 horizontal tanks at Annotation 16, 2 pressure tanks at Annotation 17, and 11 horizontal tanks at Annotation 18. There are no visible containments for these tanks. The solid waste that has been deposited at Annotation 19 varies in tone, from light to very dark, and texture which appears fine to very coarse. This rubble may have come from the construction that has occurred in this area over the past 10 years. Most of this solid waste is becoming overgrown. Along the north side of the solid waste is an area where standing liquid has accumulated (Annotation 20).

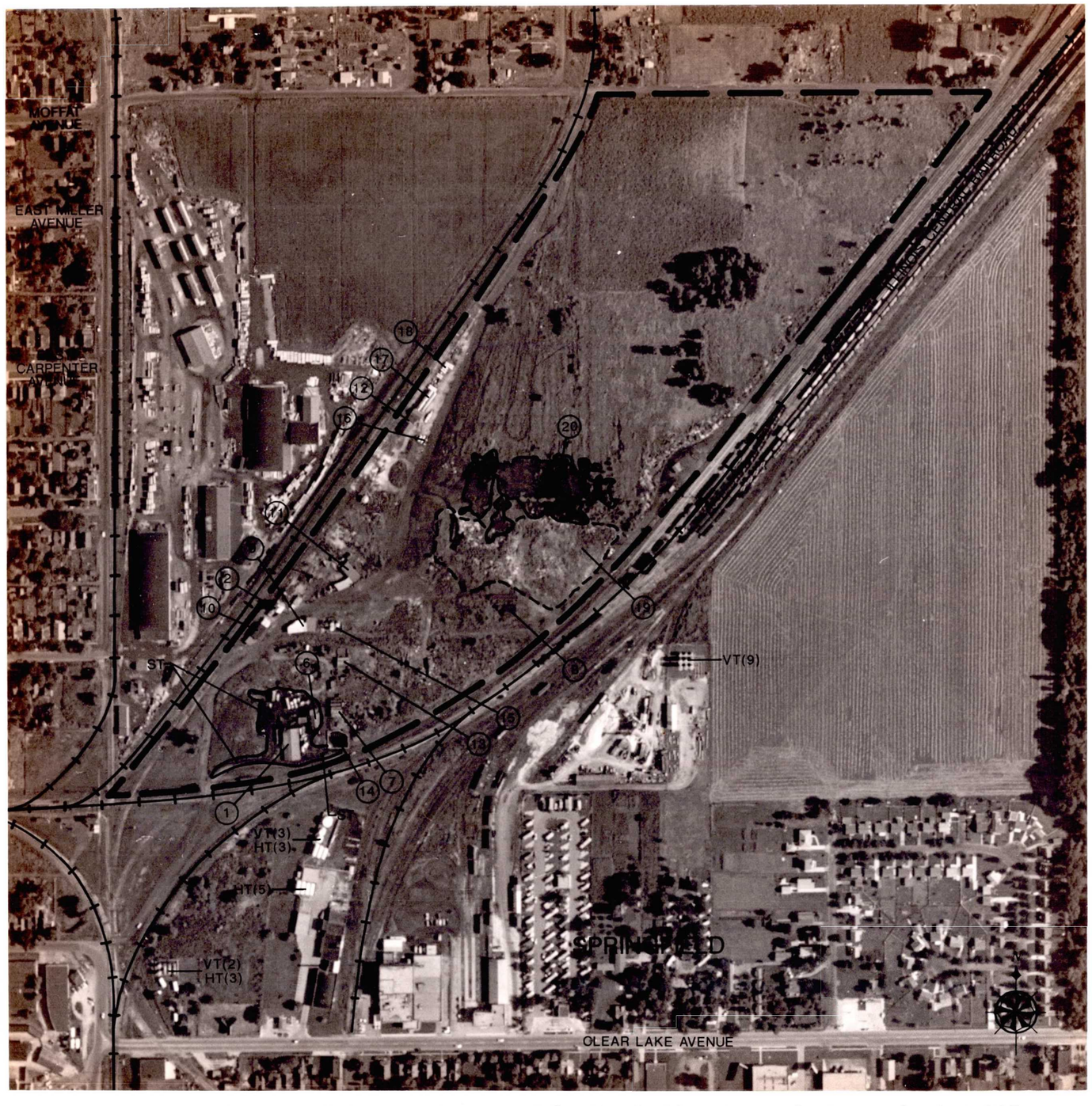

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Figure 5. Pierce Waste Oil/Moreco Energy, July 22, 1956. Approximate scale 1:4,025.

APRIL 9, 1964 (FIGURE 6)

Since the photo coverage in July 1956 there has been extensive construction and solid waste dumping in the Pierce Waste Oil/Moreco Energy study area. The new fuel distribution facility at Area B, which consists of six uncontained vertical tanks and two pressure tanks, does not appear to be associated with the site. Area C where two uncontained horizontal tanks are located and piles of light-colored materials are being processed through a sifting apparatus does not appear to be associated with the site.

The two tanks at the northwest corner of the building (Annotation 1) are leaking; the liquid has traveled in a southwesterly direction and is beginning to accumulate along the road and rail line. What was previously believed to be a tank containment (Annotation 13) has been turned into a sump and contains dark liquid with a sheen. On the east side of the sump are 13 uncontained vertical tanks (Annotation 22). Annotation 21 is the location of two small unlined pits containing dark liquid with a sheen. The ground surrounding these pits appears to be saturated and liquid has escaped from the pit, and traveled east toward the center of the site. Three uncontained horizontal tanks are located on the east side of these pits and one is on the south side. Annotation 23 is the location of four uncontained horizontal tanks. There is a small pile of rubble to the east of the tanks. Nine leaking tanks are located at Annotation 24. These uncontained tanks have stains on their tops, down their sides, and the ground around their bases are very heavily stained. Annotation 25 is a heavily stained area where four horizontal and five vertical tanks are located. These tanks are uncontained and there are stains on top of the horizontal tanks. Annotations 26 and 27 are the locations of four uncontained vertical tanks each. The sides of the unlined pit at Annotation 28 are heavily stained and there is a small amount of light-colored liquid on the bottom. One vertical and two horizontal tanks are located immediately southwest of the pit. There are five vertical tanks at Annotation 29. Four of these are missing their tops and stained down the sides. Approximately 60 uncontained drums are located at Annotation 30. Solid waste/fill material is being deposited through the remainder of the site. A large area of stained ground is being covered with this waste/fill. The western part of the solid waste /fill is being leveled.

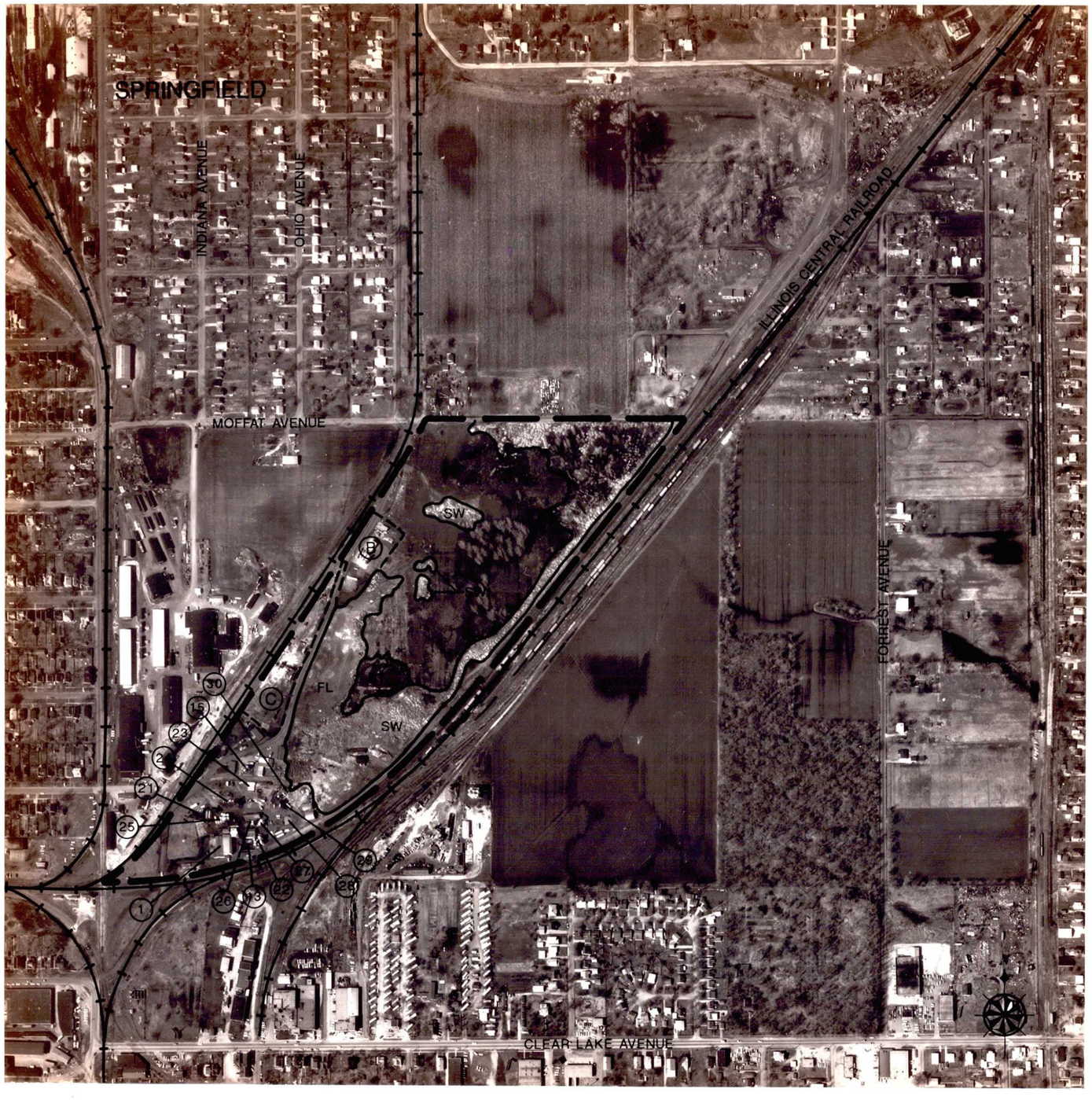

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Figure 6. Pierce Waste Oil/Moreco Energy, April 9, 1964. Approximate scale 1:6,000.

NOVEMBER 10, 1971 (FIGURE 7)

Since the April 1964 photo coverage three uncontained vertical and six pressure tanks have been added to the fuel distributor in Area B. All of the equipment has been removed from Area C. There is a pile of rubble (Annotation 31) in the southwest part of the area, which now appears to be abandoned. There has been no significant change in Area D. The vertical tanks have been removed from Area E (Figure 6, Annotation 15). Area F is a newly built concrete plant that is enclosed by a single security fence. There is new construction activity in the northern part of Area G, where four horizontal tanks are enclosed by a single security fence, and a mound of light-colored material is located. A large area of ground scarring is located in the southern part of this area.

The Pierce Waste Oil/Moreco Energy facility is now enclosed by a single security fence with three access gates. Three new vertical tanks have been added to the northwest corner of the building at Annotation 1. It appears these tanks may be leaking as there is liquid extending from this area, northwest into an open area. Four probable vertical tanks have been built at the northwest corner of the sump (Annotation 13), which appears to contain dark-colored liquid. There is no visible change in the pits and tanks at Annotation 21, and the tanks at Annotations 22, 24, 25, 26 and 27. The ground in these areas is still heavily stained. Light colored material has been spread on the staining between the tanks at Annotations 24 and 25. Six new uncontained horizontal tanks are now located immediately west of the five tanks at Annotation 23. East of this group of tanks, where drums and tanks were located in April 1964, there is rubble strewn throughout the area. A small earthen berm has been built around the pit (Annotation 28) which has a small amount of liquid in it. Annotation 32 is the location of a new group of nine vertical and eight horizontal tanks that are uncontained. The three vertical tanks at Annotation 33 have no containment. The ground throughout this site is heavily stained.

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Figure 7. Pierce Waste Oil/Moreco Energy, November 10, 1971. Approximate scale 1:5,520.

APRIL 14, 1988 (FIGURE 8)

Since the photo coverage in November 1971 there have been many changes in the Pierce Waste Oil/Moreco Energy study area. The facilities previously located in Areas C, D, E and F (Figure 7) have been dismantled and removed or abandoned. The four horizontal tanks have been removed from the northern part of the study area (Figure 7), and a new trucking operation is now located in this part of the area. There is a pile of rubble in the southern part of this area and a stack of crates to the north of the rubble.

The sump and pits previously located in the Pierce Waste Oil/Moreco Energy facility (Figure 7, Annotations 13, 21 and 28) are no longer visible. A new building (Annotation 34) has been built near the previous location of two pits. The tanks previously located around the other pits (Figure 7, Annotations 22, 26 and 27) have been removed. The tanks that were located at Annotations 24 and 25 (Figure 7) have also been removed. The tanks have been removed from the northwest corner of the building at Annotation 1. There are now 15 uncontained horizontal tanks in the vicinity of Annotation 23. Three of the tanks at the west end of this area appear to be leaking and the ground is very heavily stained. On the east side of these tanks there is a large pile of rubble. Annotation 35 is the location of 11 uncontained vertical tanks. The ground surrounding these tanks is very heavily stained. The ground surrounding the three uncontained vertical tanks at Annotation 36 is also heavily stained. Annotation 37 is the location of one large uncontained vertical tank that appears to be leaking. The area surrounding the two small buildings at Annotation 38 is heavily stained and this staining extends into a depression north of the area (Annotation 40). The four tanks located at Annotation 39 are leaking. The escaping liquid is presently collecting in the road along the southern perimeter fence.

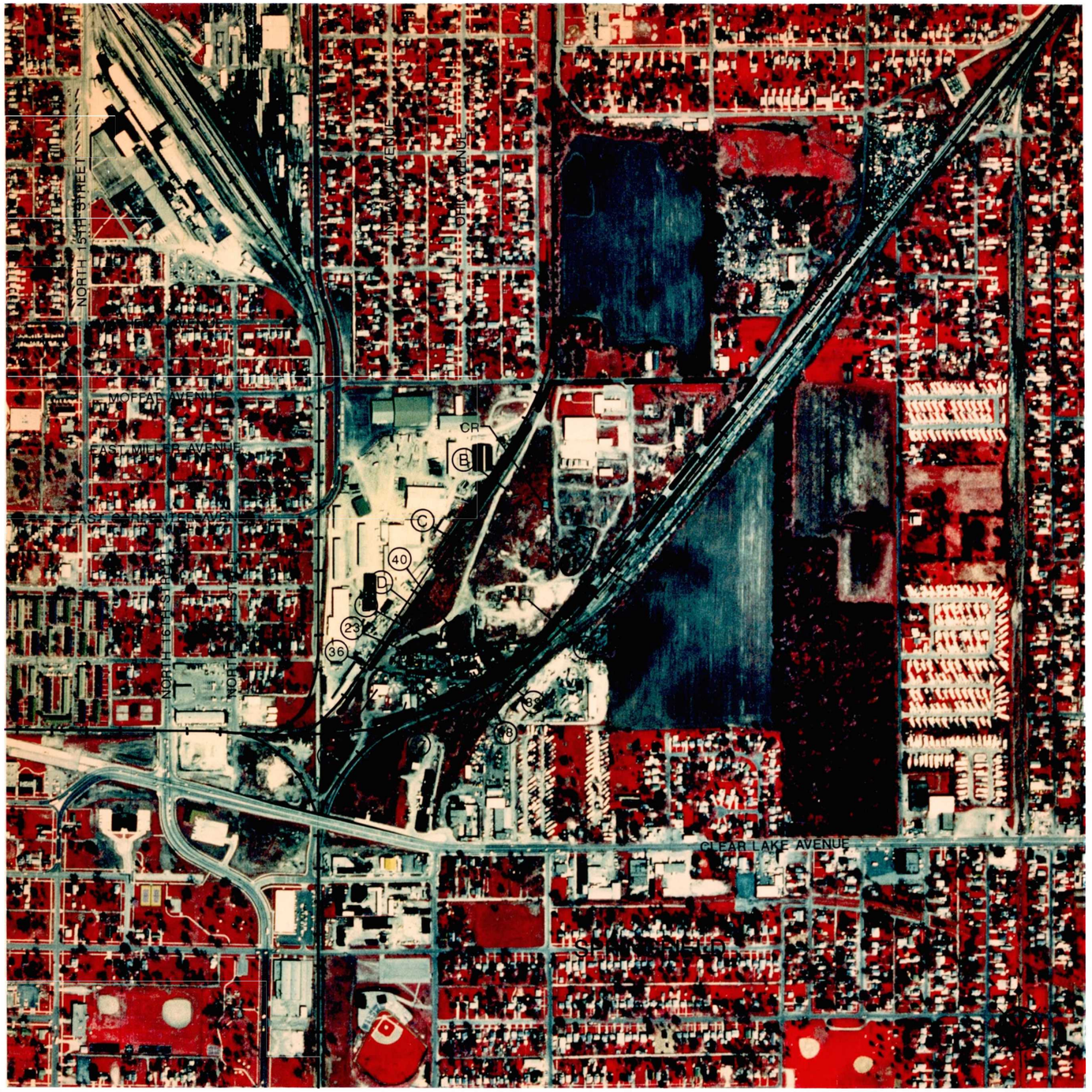

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Figure 8. Pierce Waste Oil/Moreco Energy, April 14, 1988. Approximate scale 1:8,080.